

A (Pragmatic) Future of Joint Electronic Warfare

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Editorial Abstract: Lt Col Bourque explores the challenges of contemporary Joint Electronic Warfare culture, in pursuit of a Spectrum Dominance goal. He provides a critical examination of current EW processes and methods, sounding a call to action to address today’s limitations, and offering adaptive, effects-based solutions for the Joint EW community.

The following represents the views of the author only and is not meant to represent those of US Strategic Command, the US Air Force, or the Joint Information Operations Warfare Command.

In the relatively short existence of the JIOWC’s Joint Electronic Warfare Center, we’ve enjoyed a very unique opportunity to observe and influence many contributing capabilities within the Electronic Warfare mission area. I’d like to offer some practical perspective on how we must reconsider our shared EM processes, paradigms, and acquisition strategies in order to meet the current and projected threats. But before you invest your valuable time in reading this editorial, I would ask you to reflect on the word “harmonization.”

Right up front, I’d like to hit on three key points. First, the mission of Joint Electronic Warfare must never be relegated to the agenda of any single Service as prime manager, lest EW will ultimately be grown to serve only that Service. Second, Joint EW must never be subsumed by the Cyber mission area, lest it will be grown to serve only Cyber... there are four other warfighting Domains still worthy of support. Lastly, our shared EW processes have ‘unwittingly’ been grown to prevent the most capable and entitled organizations from managing them; they have instead inculcated unfortunate organizational attributes which guard them against formalized coherence. (Soapbox dismounted.)

I am also told it’s good to begin with an anecdote every now and again. Imagine that we’re in the middle of a large deployment of land forces in a far away place. Several of the locals develop an inexplicable dislike for us over time and place RF-controlled ‘minefields’ to deny our free access to

the battlespace (generating some fairly useful IO messaging in the process). To break the RF link in these improvised explosive systems, we rapidly build and deploy thousands of very clever road-portable jamming systems based on reactive architecture (i.e., sense and respond), ostensibly employing finesse to cause minimal disturbance to an EME which is arguably the most congested on the planet... an action somewhat akin to sending a Rolls Royce into a NASCAR race.



The problem is when the advanced jammers arrive, they are met with in-band Blue Force communications, ISR [intelligence, surveillance, reconnaissance] conflicts, incompatible sister-Service active ground jammers (whose application did not spur a raft of derivative cottage industries, in contrast to their reactive counterparts), conflicts with proven, active airborne Electronic Attack (EA) capabilities, undeclared Grey EA devices, a wealth of legitimate in-band ‘White’ civil-commercial traffic, and a resultant EME judged too complex to merit legitimate use of a brand new ‘5th Gen’ fighter. No coherent set of Joint EM management processes awaited those deploying forces, just cool new toys, very good intentions, and a *ton* of

hard work to be done by a few talented warfighters trying to make sense of it all. What’s the moral? Without senior advocacy, coherent Joint oversight, and adequate, timely resourcing for Joint EW, “EMI happens.”

The ‘New Status Quo’

There is now a battlespace-driven revolution in EW requirements. Joint EW’s 21st century challenge is to accept that, for the first time in the history of warfare, “tech peer” adversaries will intend, as their going-in position, to execute broad Spectrum denial against Blue Forces, exploiting known and systemic vulnerabilities, potentially denying physical battlespace access for some critical period of time. FACT: Spectrum is no longer an ‘unlimited resource.’ A concurrent migration (or expanding inclusion) in EM battlespace technologies is taking us from government-off-the-shelf (GOTS) to commercial-off-the-shelf (COTS) hardware, from high-power to low-power, from analog to digital, from airborne delivery to multi-Domain delivery (to include Land, Sea, and Space), from miles to meters in many cases, and certainly from RF-centric applications to multi-spectral effects. In the massive, transformational “retooling” effort escorting the DOD involuntarily from a Major Combat Operation (MCO) posture to a more unsettling counterinsurgency (COIN) focus, we must keep our eye on the long fight and appreciate that these shifts to meet the new asymmetric adversary, ideologically-fueled and COTS-enabled in the leading case, in fact represent an expanding mission set. We cannot forfeit proficiency or capacity in the classical aspects of EW just to meet the current threat. The list of things to do just got larger. Red Force EM targeting of our GPS, IADS, Comms, Space, C2,

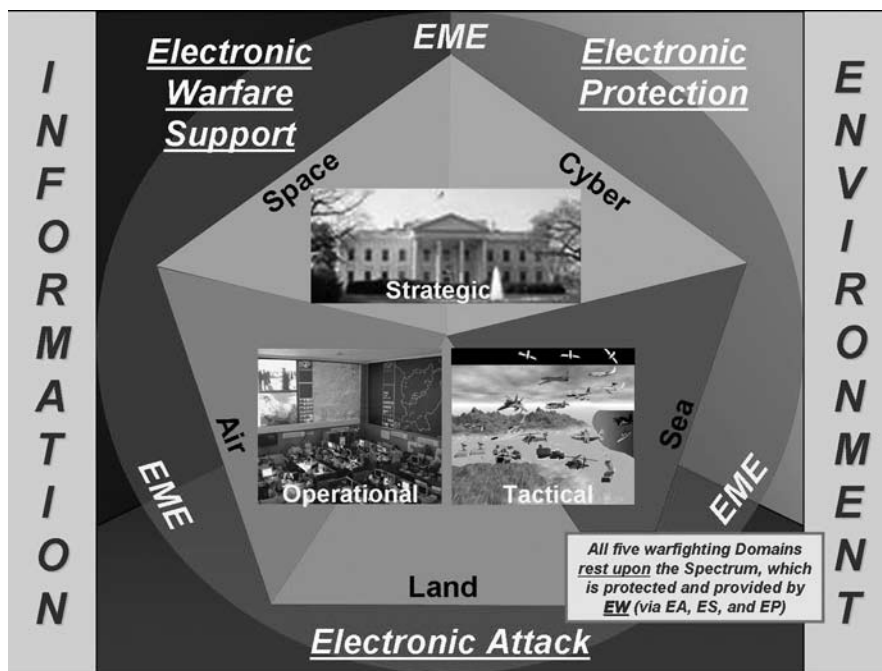


Figure 1. Information Environment (Temple & West)

ISR, and Cyber nets should each or all be anticipated during future engagements, from contingencies to MCO. To expand on a previous point, we must also accept that EW is reaching well beyond its RF beginnings, to include directed energy (DE), high-power microwave (HPM), LASERs, IR, EO, acoustics, particle beam weapons and whatever other uglies the EM weapons experts can fathom. We must be ready, yet we may already be late.

The above graphic (Figure 1) is a simple, pragmatic, and objective depiction of the status quo. There are five warfighting Domains (Air, Land, Sea, Space, and Cyber) and two Environments (Electromagnetic and Information); the EM Spectrum is present in every nook and cranny of the battlespace save for the Information Environment. The Spectrum is a continuum, directly, completely, and literally supporting the pentagon of military effort depicted. Conceptually subdividing responsibility for the Spectrum using the triad of electronic attack (EA), electronic support (ES), & electronic protect (EP), we may realize decisive effects at all three levels of combat, and in every domain. As an example, we might throw EM energy at a “soft aperture” (one ready to receive and process in-band energy) such as a

RADAR dish or an IEEE 802.11 wireless access point, delivering effects into the Land and Cyber Domains, respectively. Or feeling a bit froggy, we might direct high-energy malice like LASER, HPM, or other DE instead at a “hard aperture,” such as an unshielded circuit board with in-band resonant characteristics, or even a computer server unprotected by a Faraday Cage. Because of EW’s maturity, proven history of operational-level execution, and low potential for spillover of unintended effects, authorization to “fire” would not be as cumbersome or elevated as that of other nascent efforts... pick one.

So what is this “JEWEC?” Let me offer a *Reader’s Digest* version of the mission brief. As DOD’s Joint EW Center of Excellence under the JIOWC and US Strategic Command, we recognize Joint EW advocacy as the prime mover for all good things. In fact, the JEWEC stands as the sole durable repository for Joint EW subject matter expertise in the Department of Defense. As a unique attribute, JEWEC focuses on Joint EW effects requirements, expertly providing adaptive operational solutions to the warfighter in the near-term, while keeping our eye on the long fight and coherent evolution of long-term Joint EW / EM capabilities in support

of Global Spectrum Control. These actions are made possible by leveraging JEWEC’s broad, organic subject matter expertise against our many external partners (Service HQs, weapons schools, academia, science and technology centers, industry, the Interagency) to support the warfighter and reinforce the broader EW Community. We know everyone who is “someone” (or wishes to be) and coordinate with them all regularly. We provide all of the services depicted in the graphic, plus a few more cats and dogs when and if resources permit, and we carry a pretty deep bag of Joint EW Command and Theater-level experience in the fight. This is a key equity of the JEWEC, since there’s a world of content out there (intel, data, analysis, analysis of analysis) but it is the operational perspective that brings priceless *context*—the “so what?” value—to our Joint warfighters.

The current evolution in EW is demanding a shift away from the comfortable old “EWO is a pod” or “EW equals EA” paradigms that have brought us to this state of broad process disarray and institutional atrophy. It’s also time to officially jettison the “EW equals Air” paradigm. Not only will EW and EM process effort be required from within the other four domains, these efforts will require new Joint coherence to maintain a confident battlespace advantage over potential adversaries. This Joint coherence will directly promote Global Spectrum Control, required to support our strategic missions. We no longer enjoy the luxury of our precious “Air-centric, ELINT-specific” EW paradigm. Instead, Electronic Warfare is Global Spectrum Control, uniquely responsible for providing constant access to “contested” Spectrum and assisting in remediation and avoidance of “congested” Spectrum conditions as well. We comfortably recall the tested legacy mantra of strike aviation: “Steel on target.” Although it will certainly enjoy continued utility for the foreseeable future, it’s time now to raise a new chant: “Energy on aperture.” Arguably, the latter includes the former, just as one could successfully make the argument that EW encompasses Computer Network Operations. No

matter, because to the intrepid Electronic Warrior and the targeting experts who support him, the world is just one big collection of apertures.

If Joint EW is the operational-level aggregation of Service EM capabilities and processes for game day, coherently executed Joint EW, groomed from the inception of its capabilities by expert Joint operational oversight becomes “Strategic EW,” or Global Spectrum Control. But we cannot forget EP’s contribution to the EW triad, nor its potential impact on EM capabilities, equipment, and processes. Where EA and Electronic Warfare Support (ES) are typically “actions taken,” EP lives more as attributes which allow Blue EM capabilities to continue operations in congested and contested or denied EM environments. Examples are: JRFL process, some low observables, SINCGARS, HAVE QUICK, other spread-spectrum applications, EMP hardening, etc. This framework represents a fundamental consistency in the language of Joint Pub 3-13.1, as well as USSTRATCOM’s *Operational Concept for EW* (OCEW, 2006).

The Noble Quest For ‘Spectrum Dominance’

The concept of Spectrum Dominance has gotten a lot of mileage over recent years, and it represents a fine conceptual target for harmonizing our warfighting focus. Recalling the simple vignette at the beginning of the discussion, it is simply not realistic to expect that state as a potential result of our effort. Dominance in any play space arguably seeks to convey the owner’s ability to move freely throughout, completely unimpeded, uninfluenced, and unchallenged. From a logistical standpoint alone, the effort expended to attain such an absolute state would place us squarely at the deep end of the ‘diminishing marginal gains’ region. If we weave no other common thread throughout future military DOTMLPF [Doctrine, Organization, Training, Material, Leadership and Education, Personnel, and Facilities] considerations, it must be efficiencies that we plan to capture, not excesses. The “Reagan

money” we grew up with is but a distant memory, and new holes are being drilled into our belts for the tightening to come. But on the path to that conceptual target, we can instead be content to engage Jointly in Spectrum Control actions, which result in reliable access to enough Spectrum for conducting required operations and meeting anticipated contingencies. Adversaries can pretend to own the rest, if it suits them to think so. Frankly stated, I’ll bet we’re not going to get there from here... the Fates are conspiring against us. Instead, we must commit to constant pursuit of Spectrum Control. I don’t mean ‘omnipotence,’ but just what it takes to get the job done reliably for our Joint Force Commanders.

Our Little Boy Is Growing Up

Operational and tactical EW are non-kinetic fires. The great majority of this effort lives outside of cognitive influence as a first-order effect, and as such, outside of information operations. It’s simply about denying, degrading, disrupting, or destroying any and all adversary EM-susceptible networks, or their use of relevant parts of the Spectrum. CNO (now, Cyber) can hit many of these networks through wired coupling and a few unwired hops (such that national authorities will even allow), but Electronic Warfare as a very mature mission area can make targeted apertures of them all. EW has been capable of doing so for quite a bit longer. While we’re on that, perhaps it’s time to revisit the meaning of Network Warfare, assuming it would be organized, trained, equipped, presented, and then executed under a Title 10 [US Law] Joint Force Commander. EW has massed capabilities to attack most if not all EM-susceptible adversary network apertures (“soft” and “hard”), protecting Blue Force networks, for over six decades. In contemporary terms, examples of these adversary EM-susceptible network apertures include: Space, Comms, C2, ISR, IADS, Air-to-Air, UAVs, SCADA, computers, IEDs, etc. So in the final analysis, should CNO hold sole entitlement to “Net War” language? To be brief, no.

Here’s where it ties together: When we integrate and synchronize operational level effort all together into one coherent package, the results have unavoidably strategic significance. While major regional operations plan protect strategic national interests, USSTRATCOM’s OPLANs protect our nation. It is the coherent Joint aggregation of regional and operational-level EW effort by an empowered repository of Joint expertise that creates the durable foundation of Strategic EW to create ‘Global Spectrum Control.’ By engaging and neutralizing Red Force access (or “contested” Spectrum), as well as Blue EM process mismanagement and equipment incompatibility, Grey equipment ‘declaration’ issues, and White expansion and encroachment (all three “colors” contributing to the ever-present phenomenon of “congested” Spectrum), we can create Spectral freedom of maneuver, critical to our strategic lines of operation. We will not get there by any real measure until we designate and empower one Joint authority, an “Expert Advocate” to harmonize Service effort in EM capabilities development, process development, compatibility, interoperability, and operational execution.

A Few Supporting Characters

Since we’re speaking of Joint EW, it’s worth acknowledging that the prefix “Joint” is the perfect scalable term; one size fits all. When we use one word to denote such a diverse range of different situations and scenarios—as we have historically with near reckless abandon—what does it really mean except to serve as an institutionalized, iconic, and not-too-thinly veiled plea for resourcing? In fact, the term means many things in many situations to many different people. Often used out of habit, convenience, or to collateralize otherwise subordinate effort, use of “Joint” should be elevated to sparingly denote activities which are explicitly multi-Service and multi-Domain. Personal leanings aside, we must encourage frank and open discussion on the utility of this powerful little word for the future so that

we do not falsely create senior leader expectations of performance, scope, and jurisdiction.

The prevailing sentiment indicates that Electronic Warfare will indeed remain an articulated mission area, to exercise the critical care for and protection of the Spectrum, and not to be assimilated by any new peer mission area. This particular thread could easily consume an entire editorial discussion, but I am quite confident that this will remain the case. Joint EW will remain an articulated mission area, IF it is to provide its maximum warfighting value (as Spectrum Control), evolve, and truly adapt to battlespace demands. The simple logic follows: All military activities require reliable access to the Spectrum, Blue Force Spectrum access is provided and protected uniquely by Joint EW, and effective Joint EW can derive only from undiluted Joint advocacy and expertise.

Where Are Our 'Effects-Based Capabilities?'

We are where we are today in large part because Services, legitimately pursuing their individual mission statements and visions, have conceived EM capabilities and processes and built to their own contextual needs, each visualizing the 'next fight' from their specific frames of reference. These EM capabilities and processes are then "pushed" into the playground with the other kids with the best of intentions, with secret hope that theirs is the last kid left standing. Often the kids play together nicely, but only owing to their individual character and persistence, not for the presence of sound or coherent processes, playground ROEs, or an adequate complement of enforcers. Expressed plainly, Joint Warfighters require effects (not capabilities), effects dictate requirements, and requirements must in turn "pull" capability and process development from the Services. Further, Joint EW effects are delivered as a function of capability *and* capacity—one magic box in the closet is not enough. To date, there is much prior evidence of insufficient Joint harmonizing effort,



*JEW Challenge Coin, obverse.
(JIOWC)*

beginning from "effects required" and traveling backward to EM-compatible and interoperable Service capabilities development. So, what formally chartered and appropriately resourced Joint agency is able to meet these expectations for persistently bridging this gap? An expert agent with operationally current and durable Joint perspective must be chosen to drive the process from the top, determining Joint warfighting effects requirements, then translating them down to Services through JMETLs [Joint Mission Essential Task List] and resulting METLs, to cause a systemic upward "pull" for fully compatible and interoperable EM capabilities and processes. I believe this is supposed to be happening now, but due to lack of dedicated and empowered Joint EW advocacy, I know it doesn't, practically speaking. Under objective scrutiny, we will continue to find that ad hoc, periodic, and/or domain-, Service-, or platform-centric solutions are counterproductive, due to the false executive expectations of remedy they invariably create.

Other Findings Of Significance

Combatant Commands lack qualified, consistent EW manning; expert and persistent EW representation on COCOM staffs is hit or miss at best, mostly miss. Several COCOMs are unaware of their EW deficiency trends in manpower, effects delivery, and capabilities, since they broadly lack low density/high demand Joint EW expertise on their staffs. When a COCOM pays

attention to EW (e.g., USPACOM) results are good, but when they don't, precious EW expertise is ignored or misapplied, and atrophies. This is a critical shortcoming, since all military activities are reliant on Spectrum to some great degree (more so, as technology advances, bandwidth solutions emerge, and "wireless" expectations increase). The COCOMs simply won't know what they don't know, which will leave them disinclined to address their most elemental concerns. We must also assume from this point forward that EW capability gaps found in one AOR will be mirrored in others: current issues in USPACOM (et al) are a result of proliferation trends fueled from other parts of the world.

Shifting gears a bit, Joint targeting efforts with EW JMEM, electronic target folders, and IO JMEM initiatives, are really beginning to turn the corner—and we must encourage this activity. 'Targeting' is finally growing beyond kinetic ownership. Joint Pub 3-60 still constitutes great baseline guidance from its kinetic genesis, but as noted before, targeting is really just any effect, delivered by any message, over any medium, and not inherently kinetic as in the legacy thinking. Please recall that our objective is to rapidly instill persistent capitulation behaviors in the mind of the adversary, not just to blow up his toys. This represents a fundamental evolution in understanding, to EW's benefit. The bill is paid however, in establishing replicable, reliable, and transportable methods of 'measure of effects' (MOE) determination for EW.

As a matter of policy, EW is still regarded as one of IO's five core capabilities. Altruistically speaking, EW is more appropriately framed as a mission area, comprised of capabilities, if not only to discourage the mental baggage associated with being just a capability. Even without this new convention we'd be fine, if it weren't for that left turn we took at Albuquerque: The point of IO as an integrating strategy was to coherently leverage disparate mission areas to focus and anticipate cognitive influence. It's still viable if not essential

to that end, as a military activity. But IO has been instead dubiously applied in an ownership role, a latter-day collection of properties contrived to manufacture influence, disadvantaging its technology-intensive subordinated mission areas (e.g., Electronic Warfare), thereby constraining IO's rich intended value.

There are amazing individual efforts in EW, but soon they will no longer be enough. EW and EM responsibilities are happily scattered among OUSD (AT&L), OUSD (I), JCS, DISA, USSTRATCOM, and the Services, as an unchecked legacy of well-intended but fragmented efforts. Any Joint successes we now enjoy are testaments to our motivated, resourceful experts, but are growing increasingly unsustainable due to lack of process formalization. So, who's got the stick? Ultimately, it comes down to COCOMs possessing the means, motivation, and expertise to write intelligent, Spectrum-conscious Integrated Priority Lists (IPL), which then go back to previously-noted COCOM expert EW manning deficiencies. I've been a good many places on AFSOC missions, and I know for a fact that it's not only our technology that wins. Just as often, it's the adaptive, resourceful expertise and training invested in our warfighters. However, at a certain point along its current decline, the dive in precious human capital will simply become unrecoverable. In broader terms, we will no longer have the luxury of just allowing EW to happen to us, for neither operational nor fiscal reasons.

Clubbing on the patently obvious, Joint DOTMLPF challenges lie ahead for EW, not just the standard fare of technology solutions (i.e., the current mindset of "capabilities push," versus the JFC requirement for "effects pull"). A litany of broad endemic issues wait in the wings: Services 'organize, train, equip, and present forces' under Title 10, but Joint forces fight, so who's tracking and mitigating negative Joint EW manpower and expertise trends? Joint 'baselining' of operational EW training is fundamental to continued mission effectiveness. Who's doing that? It's not always a clash of warriors,

but increasingly one of acquisition processes. Pursuing current validation protocols, many capability gaps will not be discovered until a new capability reaches theater. We cannot really afford to invest more time and effort solving today's problems. While I enjoy the rant, our cool new air superiority assets must evolve to show relevance across the spectrum of conflict, after the "golden week" of IADS take down ops has passed, and the fight has transitioned to the "six knot war."

'Net-Centric Vulnerability'

This next point is a most valuable player. We are obviously courting a network dependency, where the near-term vulnerabilities are known and finding their way quickly into the inventories of tech-peer adversaries, often leveraged 'by proxy.' For any number of reasons, a particular nation may not have the stomach to engage the US in open combat, but they can certainly supply gap-exploiting technologies to those who will, without an afterthought. In this way, Net-Centric Warfare (NCW) threatens to become 'Net-Centric Vulnerability.' Adversaries see our net-centric implementation trends as "low hanging fruit" to be plucked. I for one don't wish to be plucked, immersed in my false feelings of NCW security. Continued reliance on insufficiently robust, adaptive, and interoperable networks invites "cascading failures" when confronted by the means of tech-peer adversaries. Bluntly speaking, a mistake becomes a crime when we find out it's a mistake and do nothing... we need to rethink our attack on this. Yet if we do this 'Jointly' and coherently (examples are out there), then we're golden.

Further, we tend to train toward what easily works well together, not inducing adequate operational stressors to emulate anticipated combat environment. It's time for honesty, not performance report bullets. Like many of our satellites currently on orbit, it was all we could do just to build systems, deploy them, and get them to work under longevity stressors, not to include contested/

congested (or denied) EM environment stressors. That gap requires investment in the near-term, as we may already be too late, owing to standard acquisition delays. Link-16 dependency introduces a single point of failure, if exploited. The same is true in space; GPS, SATCOM, and even some ISR dependencies introduce concentrated points of failure. New systems without interoperable spread-spectrum attributes invite similar systemic failures. The remedy is institutional: we must commit now to field adaptive, survivable, autonomous, and decentralized networks. Plus, we must design and field EM systems for collaborative, adaptive, and autonomous use, with attributes that provide network robustness in denied EM environments. In keeping with this theme of broad remedy, our new network paradigms must also be adaptive, robust, autonomous, collaborative, interoperable, *and* Joint to provide lasting value under anticipated adversary stressors. As the counter-IED battle continues to similarly demonstrate, it's MUCH easier to be the person supplying the short puff of air, than to be the one responsible for keeping the house of cards built.

Electronic Warfare Capabilities Based Assessment (EW CBA)

Some may have heard of USSTRATCOM's current EW CBA effort. It goes back to the USPACOM EW assessment the JEWIC was tasked to perform in the summer of 2007. That was a summer of heavy lifting for some of our team, albeit relatively limited in scope. That analysis fed a Commander USPACOM initiative to pursue a Joint Chiefs of Staff "Tank" session on EW Advocacy, which quite fortunately resulted in this tasking, directly from the Vice Chairman. If allowed to pursue the full Joint Capabilities Identification and Development System (JCIDS) process, this effort will result in one or more Joint Integrating Concept (JIC) documents. These could serve as the first operationally derived templates for harmonizing Service-level effort across EW and EM capabilities acquisition and process development. JEWIC supplied

the expert operational analysis for 80% of that PACOM high-interest briefing, yet the substantial effort addressed EP concerns only, and only in two Domains (Air and Sea). Hearing the brief, Commanders of USPACOM, USPACFLT, and USPACAF concurred on the growing need for Joint EW advocacy. This was incentive for senior leadership to convene a 21 Dec 07 JCS Tank session specifically addressing this issue, wherein CDRUSPACOM, CDRUSSTRATCOM, & VCJCS received the same USPACOM EW OA brief. The resulting VCJCS-directed EW CBA was tasked to USSTRATCOM in early 2008, to be performed by the JEWEC, based upon its recent expert joint categorization of issues in USPACOM's area of operations. However, this effort was to be even more ambitious and inclusive than the original PACOM EW OA: a global consideration of EA, ES, EP, and relevant EM processes, across all five warfighting domains. Essentially 90 days of concentrated, unbiased joint analysis to characterize three decades of negative institutional impact, the EW CBA will lead to a full JCIDS (Joint Capabilities Document producing) effort, based on current indications from our leadership. Deliverables and analytical results of this effort could finally, authoritatively create a coherent template for harmonizing Service-level EW efforts.

Progress and Success in the EW Community

A while ago, I spoke of noteworthy individual efforts... they're certainly out there, with a few leading examples below. However, true success in the future will be based not only on our ability to characterize Joint Warfighting effects and work backward to harmonize Services' effort (an evolutionary systemic endeavor), but also to take these very promising opportunities and weave them into a new cultural baseline of Joint coherence:

- Army commitment to EW as a new core competency
- USN investment in Army EW (JCCS-1, NAVEODTECHDIV, etc)

- EM RED TEAM Growth and EW Spiral to IO Range
- Advocacy: PACOM EW Ops Assessment and the JCS "EW Tank"
- Electronic Target Folders (ETF) and EW JMEM development
- OSD (AT&L) EW Joint Analysis Team (JAT) establishment
- USN "Next-Generation Jammer" Program
- JEWPC Course and 'Joint EW Training Summit I'
- NGES Database, replacing legacy EWIR Database
- OSD(AT&L) EW Roadmap (*now we need a signature*)
- VCJCS EW CBA tasking, with JIC/JCD to follow

The Way Ahead For Joint EW

Our new processes must be adaptive, focused, and anticipate the realities of change and resistance. They must take into account not only COTS evolution, weaponization, and availability but also the potential for hybrid COTS and GOTS adaptations to employment. We must commit to deconstruct, redesign, and streamline existing Joint EW and EM processes to make them survivable, and

to maintain our fragile leadership in the battlespace.

The CJCS needs one *empowered*, globally-aware but operationally-focused Joint EW executive agent that can inspire Service and COCOM process coherence, and organically provide informed and operationally sound acquisition recommendations. Ultimately, demand trends in the EM battlespace dictate that this consolidation of expert Joint EW authority must occur. With the impending US administration change and the near certainty of increased budgetary scrutiny and restraint, we must as the Joint EW Community of Interest optimize our shared processes, capture any efficiencies we can, and dictate our own recapitalization from within. These efforts must be undertaken among experts to ensure duplication is minimized across the Joint Force, lest "others" less wise in the true requirements of coherently applied EW as Global Spectrum Control should do it for us, for our own good. Borrowing words from perhaps our first and certainly most renowned Electronic Warfare Officer, Albert Einstein: "We can't solve problems by using the same kind of thinking we used when we created them." Amen. 